



# The Green Building Policy



for Government of Manitoba Funded Projects

# **Green Building Policy for Government of Manitoba Funded Projects**

Prepared by:

Manitoba Green Building Policy  
Interdepartmental Working Group

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## **Green Building Policy for Government of Manitoba Funded Projects**

### **1. Vision, Purpose and Goals**

The vision of this policy is to create a significant improvement in how new and renovated buildings that are funded by the Government of Manitoba perform over their entire life cycle from an environmental, energy and economic perspective.

“Green building” is a term used to describe projects that are sited to promote liveable communities; protect sensitive lands and preserve natural resources; are energy efficient and/or use renewable energy; incorporate environmentally-friendly building materials and practices; and promote occupant health and well-being.

This policy stems from compelling evidence from other jurisdictions, and a growing number of projects in Manitoba, that green buildings offer Manitoba taxpayers significantly better value than conventional practices when a full range of costs and benefits are calculated. This document is also a response to the recognition that overcoming barriers to the wider adoption of green building practices in Manitoba’s public sector requires new policy and support.

The general purpose of this policy document is to provide the green building principles and practices that are to be used for projects that are funded either in whole or in part by the Government of Manitoba. Specific goals are to:

- Reduce overall expenditures through improved building performance, full cost accounting and a life-cycle approach to costing.
- Reduce Manitoba’s exposure to the price volatility and long-term supply concerns associated with the use of non-renewable fossil fuel imported from outside the province (i.e. natural gas, fuel oil and propane).
- Create a common and consistent framework for green building standards across provincial government departments, crown corporations and agencies as well as other levels of government (i.e., municipalities, local government districts) or entities that receive provincial government funding for building projects.
- Minimize the negative environmental impacts associated with building site selection, construction, renovation, operation, maintenance, repair and demolition or deconstruction without impairing the intended use or function of the building.

- Lower greenhouse gas emissions from Manitoba's building sector by improving energy efficiency and expanding the use of clean renewable energy.
- Capitalize on other benefits often achieved by green buildings such as healthier, more productive indoor environments and improved asset value.
- Create economic opportunities for Manitoba businesses by stimulating the demand for green building products and services.

## **2. Background**

The buildings sector is a significant contributor to depletion of natural resources and is a major cause of greenhouse gas emissions, air and water pollution, solid waste, deforestation, toxic waste, health hazards and other negative consequences.

However, green buildings have demonstrated that they significantly reduce these impacts and achieve many other benefits when compared to conventional building practice. For a building owner or operator, these potential benefits include:

- Avoided capital costs (e.g., reduced infrastructure costs, reduced material use, savings in construction waste disposal, downsized mechanical equipment, financial incentives and tax credits, etc.).
- Reduced operating costs (e.g., lower energy costs, lower water and sewage charges, greater durability and fewer repairs, reduced cleaning and maintenance, reduced cost to reconfigure office space and relocate workers, reduced waste generation, etc.).
- Other economic benefits (e.g., increased property value, easier employee recruiting, reduced employee turnover, reduced liability risk, positive public image, generation of new economic development opportunities, etc.).

From a broader societal perspective, the benefits of green buildings include:

- Health and productivity (e.g., reduced absenteeism, improved worker productivity, improved learning in schools, faster recovery from illness in health care facilities, etc.).
- Community and social (e.g., reduced demand on municipal services, reduced traffic congestion and sprawl, support of local businesses, etc.).
- Environmental (e.g., reduced greenhouse gas emissions, less use of non-renewable energy sources, minimized ozone depletion, reduced toxic emissions, reduced resource extraction impacts, protection of biodiversity, less local and regional air and water pollution, etc.).

Passed in 1998, Manitoba's *Sustainable Development Act* recognizes that the economy, the environment, human health and social well-being should be managed for the equal benefit of both present and future generations. The legislation states that economic decisions, including purchasing decisions, should adequately take into account their environmental, human health and social consequences.

The Act also recognizes that the public sector, through its internal operations and procurement practices, has an integral role in promoting environmental awareness and sustainable development. Manitoba's *Sustainable Development Procurement Goals* developed in response to the Act specifically reference pollution prevention and human health, reduction of fossil fuel emissions, resource conservation and community economic development. Government departments and publicly funded agencies are required under this legislation to apply the principles of sustainable development in their operations.

The *Manitoba Building Code*, which adopts the *National Building Code of Canada*, is primarily a minimum set of requirements for safety, health, accessibility, and fire and structural protection of buildings. It also has some minimum energy performance requirements for new houses and a strategy is being developed to add similar requirements for new commercial and institutional buildings. However, the Code currently does not have any minimum standards or recommendations for green building design, construction or renovation. As a consequence, provincial government departments, crown corporations and agencies must instead rely upon a variety of voluntary programs, guidelines, and rating systems (e.g., Power Smart™, LEED®, Green Globes™) to reduce the energy use or environmental impact that result from their building projects.

During the 2005/06 Estimates process, departments that incur capital investment expenditures were requested to include green requirements when reviewing all capital-related projects. Subsequently, Treasury Board directed that a provincial green building policy be developed. As a result, the Green Building Policy Interdepartmental Working Group was established to guide development and implementation of the policy (see Appendix A for a listing of the participating departments and their representatives). This document is the second version of what will be an ongoing process of further development and refinement of this policy.

*Commentary: For a copy of an analysis of the costs and benefits of green buildings, see:*

- *The Costs and Financial benefits of Green Buildings: A Report to California's Sustainable Buildings Task Force*  
<http://www.ciwmb.ca.gov/greenbuilding/Design/CostBenefit/Report.pdf>

*For a review of literature and case studies from Canada, the United Kingdom and the United States that demonstrate that green buildings are not only good for the environment, they also have many financial and other benefits, see:*

- *Green Value: Green Buildings, Growing Assets published by the Royal Institute for Chartered Surveyors*  
<http://www.rics.org/Practiceareas/Builtenvironment/Sustainableconstruction/Green+value.htm>

### **3. Scope**

3.1 Building Projects Covered by this Policy – This policy applies to the site selection, design, construction and renovation of non-residential buildings (excluding industrial occupancies and farm buildings as defined in the National Building Code of Canada). Unless otherwise permitted under Sub-sections 3.2 and 5.3, all new buildings and additions to existing buildings with a building area of 600 sq. m. (6,458 sq. ft.) or more as well as major renovations of existing buildings where the economics of new construction apply, shall meet or exceed the design, environmental and energy requirements described in Section 4 of this policy.

*Commentary: Although not mandatory, projects less than 600 sq. m. (6,458 sq. ft.) in building area should follow the requirements in Section 4 to the greatest extent that is practical.*

*The “economics of new construction” refers to major renovation projects where the estimated renovation costs exceed 50 per cent of the cost of a new building of equivalent size and function. Where renovation costs are less than 50 per cent, and major building components or systems are to be replaced for reasons not related to environmental or energy performance, the requirements in Section 4 are not mandatory but should be followed to the greatest extent practical.*

*It is anticipated that the scope of future versions of this policy will be expanded to:*

- *reduce the environmental impacts from building operation, maintenance, repair and demolition or deconstruction*
- *include residential buildings (both single family and multi-family)*
- *include leased accommodations*
- *include a requirement for projects to offset greenhouse gas emissions through the purchase of ‘carbon credits’ or other actions where avoiding the use of non-renewable, carbon-based energy sources such as natural gas, fuel oil or propane is not feasible or not cost-effective*

3.2 Organizations Affected by this Policy – This policy applies to all Government of Manitoba departments, crown corporations and agencies as well as other entities that are either provincially funded or receive a direct capital contribution for a building or renovation project described in Sub-section 3.1 with the exception of organizations receiving project funding solely from either the:

- Power Smart Program operated by Manitoba Hydro; or
- Designated Heritage Building Grants Program operated by the Historic Resources Branch of Manitoba Culture, Heritage and Tourism.

*Commentary: These programs typically provide a small but worthwhile incentive that leverage much larger investments in energy efficiency or building conservation. It is not the intent of this policy that these incentives trigger the need for a large-scale environmental upgrading where the incentive factor is lost and the owner therefore might not take up the necessary energy retrofit or conservation work.*

3.3 Transition Period and Effective Date – This policy shall affect all building and major renovation projects and organizations noted in Sub-sections 3.1 and 3.2 in two phases:

- Phase One (Transition Period): Compliance shall be voluntary for all projects that receive funding approval between April 1, 2006 and March 31, 2007.
- Phase Two (Effective Date): Compliance shall be mandatory after April 1, 2007 for all projects unless exempted under Sub-section 5.3.

*Commentary: Projects approved during Phase One, and those that have received approval prior to April 1, 2007 but have not entered the detailed design stage, should follow the requirements in Section 4 of this policy to the greatest extent that is practical.*

#### **4. Design, Environmental and Energy Requirements**

4.1 Integrated Design Process – Projects covered by this policy shall use an integrated design process.

*Commentary: The design process itself is the most important contributor to the realization of high performance buildings. An integrated design process (IDP) is a holistic, collaborative and comprehensive design process that brings together all of a project's design professionals and specialty consultants along with the building owner, the builder and sub-contractors (if already selected), the future occupant(s), and other direct stakeholders to design the building as a team.*

*An IDP is not a series of meetings where responsibilities and tasks are assigned, but instead it is a process whereby people work together to design the building. For a project, an IDP often begins with a series of intensive one to three day long design charrettes. Team formation and goal setting are critical early stage components.*

*For more information about the Integrated Design Process, see:*

- *C-2000 Integrated Design Process (Natural Resources Canada)*  
[http://www.sbc.nrcan.gc.ca/buildings/idp\\_e.asp](http://www.sbc.nrcan.gc.ca/buildings/idp_e.asp)
- *Integrated Design Process Guide (Canada Mortgage and Housing Corporation)*  
[http://www.cmhc-schl.gc.ca/en/inpr/bude/himu/coedar/upload/Integrated\\_Design\\_GuideENG.pdf](http://www.cmhc-schl.gc.ca/en/inpr/bude/himu/coedar/upload/Integrated_Design_GuideENG.pdf)

- 4.2 Environmental Requirements – All building projects covered by this policy shall achieve a minimum of Silver certification under the Canada Green Building Council's LEED® Canada-NC Version 1.0 Green Building Rating System for New Construction and Major Renovations.

*Commentary: LEED® (Leadership in Energy and Environmental Design) is a consensus-based rating system that provides third-party verification of green buildings. It awards points for meeting specific performance criteria, organized into five main categories: Sustainable Sites; Water Efficiency; Energy & Atmosphere; Materials & Resources; and Indoor Environmental Quality (see Appendix B). A sixth category, Innovation & Design Process, provides the potential for recognition of innovation. Green building projects using LEED® are certified with a rating - Certified, Silver, Gold, or Platinum – that is determined by the total number of points attained. In Canada, LEED® is offered and managed by the Canada Green Building Council under licence from the U.S. Green Building Council.*

*For projects choosing to pursue the Certified Wood credit, the LEED® rating system currently only accepts Forest Stewardship Council (FSC) certified wood-based products and materials. The Government of Manitoba recognizes all three major forest certification standards in use in Canada: CSA Sustainable Forest Management Standard (CSA); Forest Stewardship Council's Principles and Standards (FSC); and the Sustainable Forestry Initiative (SFI). The Manitoba Government is aware that the U.S. Green Building Council is re-evaluating their position on forest certification standards. The Manitoba Government supports the recognition in LEED® of all three forest certification standards used in Canada (i.e., CSA, FSC and SFI).*

*For more information about LEED® Canada, please see the following link:*

- *Leadership in Energy and Environmental Design (Canada Green Building Council)*  
<http://www.cagbc.org/leed/systems/rating/index.htm>

4.3 Energy Efficiency Requirements – In addition to the environmental requirements described in Sub-section 4.2, all building projects covered by this policy must also:

- achieve at least 3 points under the *Optimize Energy Performance Credit* of the LEED® Canada-NC Version 1.0 rating system
- comply with the requirements to achieve designation as a Power Smart Building in accordance with Manitoba Hydro's *Power Smart Design Standards for New and Renovated Buildings (Second Edition)*

*Commentary: The three points under the Optimize Energy Performance credit in LEED® requires a reduction in projected energy use at the design stage of at least 33 per cent for new buildings and additions relative to a reference building defined by the Model National Energy Code of Canada for Buildings 1997 (MNECB) and 24 per cent for major renovations relative to a reference building defined by MNECB.*

*For information about the energy efficiency standards and programs noted above, please see the following links:*

- *Model National Energy Code of Canada for Buildings 1997*  
[http://www.nationalcodes.ca/mnecb/index\\_e.shtml](http://www.nationalcodes.ca/mnecb/index_e.shtml)
- *Power Smart Design Standards (Manitoba Hydro)*  
[http://www.hydro.mb.ca/your\\_business/design\\_standards/index.shtml](http://www.hydro.mb.ca/your_business/design_standards/index.shtml)

4.4 Low or Zero Carbon Renewable Energy Sources – Except for temporary, back-up or emergency power, all new buildings covered by this policy shall give preference to renewable low or zero carbon energy sources and systems (e.g., ground source heat pumps, passive solar, thermal solar, photovoltaics, wind, biomass, etc.) for space heating, domestic water heating, ventilation, lighting and other major building loads, unless it can be shown they are not cost-effective on a life-cycle cost basis.

*Commentary: Renewable low or zero carbon energy sources minimize greenhouse gas emissions that contribute to climate change. Because in most years more than 95 per cent of the electricity generated in Manitoba is supplied by renewable hydro resources, and the next increments of generation are large-scale wind and run-of-the river hydro electric dams, grid-supplied electricity shall be considered a low carbon energy source. However, conventional electric resistance heating should be avoided (except for small incidental loads) to minimize contributions to peak system loads.*

*For information about low or zero carbon renewable energy sources, see:*

- *Natural Resources Canada ecoEnergy for Renewable Heat*  
<http://www.ecoaction.gc.ca/ecoenergy-ecoenergie/heat-chauffage/index-eng.cfm>

- 4.5 Carbon-Based Energy Sources – If it can be shown that low or zero carbon energy sources are not cost effective on a life-cycle cost basis for a building's base and intermittent heating loads, then a high efficiency carbon-based fuel system may be considered. Electric resistance heating systems shall not be given preference over a high efficiency carbon-based fuel system for any of the base and intermittent heating loads in the building, unless it can be shown that it has the lowest life cycle cost for that load.

*Commentary: Hybrid combinations of two or more energy sources should be considered as an option as some energy sources are better suited to serve intermittent loads such as ventilation.*

- 4.6 Flexibility of Energy Source – To reduce exposure to future energy price volatility and to facilitate future changes to alternative energy sources, systems shall be designed for flexibility of energy source. Systems that are designed to be 'energy source flexible' shall be given preference wherever possible for all base load heating systems.

*Commentary: As an example, low temperature hydronic systems can be designed and installed to work with boilers utilizing a broad range of energy sources (e.g., biomass, geothermal, high efficiency fossil fuel, solar thermal, hydrogen or electricity). Hydronic systems also facilitate the implementation of dual fuel systems now or in the future. Similarly for smaller buildings and loads, modular forced air systems can be easily converted from one energy source to another by switching out furnaces or fan coil units.*

- 4.7 Adaptive Reuse and Deconstruction of Existing Buildings – Consideration shall be given to the adaptive reuse of existing buildings, especially those of significant cultural or historic value, to capture the embodied energy and other resources that these buildings contain. Where it isn't feasible to reuse an existing non-designated building, the deconstruction and reuse of the building materials rather than demolition should be explored.

*Commentary: For guidelines and standards about the preservation, rehabilitation, restoration and retrofitting of historic buildings, please refer to:*

- *Standards and Guidelines for the Conservation of Historic Places in Canada (Parks Canada)*  
[http://www.pc.gc.ca/docs/pc/guide/nldclpc-sqchpc/index\\_E.asp](http://www.pc.gc.ca/docs/pc/guide/nldclpc-sqchpc/index_E.asp)

- *Exploring the Connection Between Built and Natural Heritage* (Heritage Canada Foundation)  
<http://www.heritagecanada.org/eng/GreenReport2Eng-Read.pdf>
- *CSA Standard Z782-06 Guideline for design for disassembly and adaptability in buildings* (Canadian Standards Association)  
<http://www.csa-intl.org/onlinestore/GetCatalogDrillDown.asp?Parent=4367>

## 5. Policy Administration and Support

5.1 Green Building Coordination Team – A Green Building Coordination Team shall administer and support this policy. Duties of this team include:

- Development and distribution of a *Green Building Policy Implementation Guide* and a Web site for the effective communication and application of this policy.
- Outreach and education for organizations that will be impacted by this policy.
- Collaborating with organizations and building partnerships to ensure that the necessary skills, tools and awareness are developed to ensure that the policy is effectively implemented.
- Providing interpretations about the application of this policy and issuing revisions or clarifications.
- Monitoring the impact and outcomes generated by this policy.
- Drafting a future expansion of the policy to cover residential buildings, leased accommodations, residential buildings and issues related to minimizing environmental impacts from building operation, maintenance, repair and demolition.
- Coordinating the Green Building Policy Interdepartmental Working Group.

5.2 Independent Verification/Validation – Independent, third-party verification or validation shall be used to confirm that the environmental and energy requirements described in Section 4 have been met. All building projects covered by this policy must:

- be certified by the Canada Green Building Council for the LEED® requirement
- seek validation of the projected energy performance of the proposed building design against the Model National Energy Code of Canada for Buildings 1997 (if eligible) through Natural Resources Canada's *ecoENERGY for Buildings and Houses Initiative*, or through an equivalent service as defined by the Canada Green Building Council

- obtain a letter from Manitoba Hydro indicating the utility has accepted a signed letter of commitment from the project architect or engineer that the proposed building design will meet or exceed the *Power Smart Design Standards for New and Renovated Buildings (Second Edition)*

*For more information about validation of projected energy performance please see:*

- *Natural Resources Canada Validation of New Building Models with Respect to the Model National Energy Code for Buildings (MNECB)*  
<http://oee.nrcan.gc.ca/commercial/newbuildings/validation.cfm?attr=20>

5.3 Equivalencies, Reduced Requirements or Exemptions – Project proponents may suggest alternatives to the requirements of this policy at the schematic design and cost estimating stage. This request should be directed to the Green Building Coordination Team identified in Sub-section 5.1 and demonstrate that:

- the intent of the policy will still be met
- the energy and performance of the building project will still meet or exceed the specific standards described in Section 4
- the life-cycle cost of the building project will be the same or less

Lower levels of environmental and energy performance may be also acceptable where it can be demonstrated by a registered architect, engineer or certified engineering technologist who is also a LEED® Accredited Professional, or ecoENERGY Design Assessor that the requirements specified in Section 4 are not cost-effective on a life-cycle basis or would unduly impair the usability, function or appearance of the proposed building, addition or renovation.

Certain projects may be exempted from some or all of the requirements in Section 4 where it can be demonstrated that the nature of the building's occupancy, need or site conditions make it impractical to follow the policy (e.g., designated historical buildings, temporary buildings, building renovations needed in response to a public emergency, unoccupied buildings, buildings with specialized functions, etc.).

*Commentary: All exempted projects must still attempt to incorporate green building principles and practices to the greatest extent practical.*

*Using the Green Globes™ Design for New and Renovated Buildings and achieving a 3 globe rating and certification with at least 70 Energy Performance Points is an example of an acceptable alternative to the requirements of Sub-sections 4.2 and 4.3 to achieve a minimum of LEED® Silver certification with at least three points under the Optimize Energy Performance Credit.*

*For more information about Green Globes™ Design, please see the following link:*

- *Green Globes™ Design (Canadian Energy Efficiency Alliance and ECD Energy and Environment Canada Ltd.)*

<http://www.greenglobes.com/design/about.asp>

5.4 Support and Policy Interpretation – For support and assistance with interpreting the application of this policy, or to submit a request for an equivalency, exemption, or reduction in the required level of environmental or energy performance, contact the Green Building Coordination Team at [greenbuilding@gov.mb.ca](mailto:greenbuilding@gov.mb.ca).

## **6. Budgeting and Financial Implications**

Based on green building experience in Manitoba and other jurisdictions, it is expected that any increase in capital cost needed to satisfy this policy will be modest and should be more than offset by lower operating costs, improved productivity and enhanced asset value. To minimize any financial impacts, the use of financial incentives and in-kind technical support from the Federal Government and Manitoba Hydro should be maximized. However, it is recognized that some adjustments may be needed to the normal design fees and capital construction cost guidelines used by government departments, crown corporations and agencies.

Life-cycle cost analysis conducted for projects covered by this policy shall use a uniform set of key assumptions provided in the *Green Building Policy Implementation Guide*. Examples of these factors include:

- the discount rate
- annual escalation rate for electricity costs
- annual escalation rate for natural gas, propane, and fuel oil costs
- annual escalation rate for building operating costs (excluding energy)
- the reduction in staffing costs due to improved productivity
- a cost per tonne for greenhouse gas emissions

*Commentary: For examples of good practice regarding life-cycle costing of the energy and environmental performance of buildings, please refer to:*

- *ASTM E917-05 Standard Practice for Measuring Life-Cycle Costs of Buildings and Building Systems*  
[http://www.astm.org/cgi-bin/SoftCart.exe/DATABASE.CART/REDLINE\\_PAGES/E917.htm?L+mystore+ebse3316](http://www.astm.org/cgi-bin/SoftCart.exe/DATABASE.CART/REDLINE_PAGES/E917.htm?L+mystore+ebse3316)
- *Life-Cycle Cost Analysis (U.S. Department of Energy)*  
<http://www1.eere.energy.gov/femp/program/lifecycle.html>

- *Building for Energy and Economic Sustainability*  
<http://www.bfrl.nist.gov/oa/software/bees.html>
- *RETScreen® International Clean Energy Project Analysis Tools*  
<http://www.retscreen.net>

*For more information about budgeting or to discuss financial implications of implementing this policy, please contact the Treasury Board Secretariat.*

## **7. Reporting and Evaluation**

7.1 Monitoring and Review – The impacts of this policy will be assessed on an ongoing basis by the Green Building Coordination Team and adjusted when necessary after consultation with the Manitoba Green Building Policy Interdepartmental Working Group. An interim review of the policy will be completed by March 31, 2008 and a more in-depth review by March 31, 2009.

*Commentary: The evaluation of this policy and its implementation will follow the guidelines available from the following sources:*

- *Treasury Board of Canada Secretariat's Centre of Excellence for Evaluation*  
[http://www.tbs-sct.gc.ca/eval/common/us-nous\\_e.asp](http://www.tbs-sct.gc.ca/eval/common/us-nous_e.asp)
- *Canadian Evaluation Society*  
<http://www.evaluationcanada.ca>

7.2 Pre-Construction and Post-Occupancy Surveys – To enable the impact of this policy to be effectively monitored, organizations identified in 3.2 shall complete the following forms for each building project that falls within the scope of this policy and submit these forms to the Green Building Coordination Team:

- Pre-Construction Green Building Survey at the schematic design phase and cost estimating phase.
- Post-Occupancy Green Building Survey within six months of project completion and occupancy.

7.3 Project Contact Person – For each building project affected by this policy, organizations identified in 3.2 shall appoint a contact person who will be deemed to be responsible for ensuring compliance with this policy.

## Appendix A – Manitoba Green Building Policy Interdepartmental Working Group

<u>Representative</u>	<u>Department</u>	<u>Program (Position)</u>
<b><u>Co-Chairs:</u></b>		
Todd Callin	Finance	Treasury Board Secretariat (Capital Planning Analyst)
Rodney McDonald	Labour and Immigration	Office of the Fire Commissioner (Manger, Building Policy & Sustainability)
<b><u>Working Group Members:</u></b>		
Elaine Buchanan	Agriculture, Food and Rural Initiatives	Finance and Administration (Acting Manager)
Laurie Streich	Conservation	Pollution Prevention Branch (Director)
Patrick Done	Culture, Heritage and Tourism	Community Places Program (Director)
David Firman	Culture, Heritage and Tourism	Historic Resources (Architect)
George Marchildon	Education, Citizenship and Youth	Public Schools Finance Board
Robert Bisson (Alternate)	Education, Citizenship and Youth	Public Schools Finance Board
Terry Kozak	Family Services and Housing	Manitoba Housing & Renewal Corporation (Analyst)
Ray Saltel	Family Services and Housing	Manitoba Housing Authority (Energy Manager)
Pat Kuzyk	Finance - Treasury Board Secretariat	(Director, Capital Infrastructure and Asset Management)
Norman Blackie	Health	Capital Planning (Senior Planner)
Angela Driver (Alternate)	Health	Capital Planning (Project Manager)
Rod Berscheid	Infrastructure and Transportation	Corporate Accommodation Planning (Director of Operations)
Pat Landry	Infrastructure and Transportation	Accommodation Services Division (Director, Project Services)
Barb Harrison	Infrastructure and Transportation	Canada-Manitoba Infrastructure Secretariat
Molly Johnson	Intergovernmental Affairs	Community Planning & Development (Project and Policy Analyst)
Shaun Loney	Science, Technology, Energy and Mines	Energy Development Initiative (Director, Energy Policy)
Ken Klassen	Science, Technology, Energy and Mines	Energy Development Initiative (Policy Analyst)
Robert Walger	Science, Technology, Energy and Mines	Energy Development Initiative (Project Manager)
<b><u>Ex-Officio:</u></b>		
Sig Laser	Conservation	Policy Analyst
Jamie Hopkins	Manitoba Hydro	Commercial Marketing Programs (Supervisor)

## Appendix B – LEED® Canada-NC 1.0 Project Checklist

<b><u>Sustainable Sites</u></b>	<b><u>14 Points</u></b>
<input type="checkbox"/> Prereq 1 <b>Erosion &amp; Sedimentation Control</b>	Required
<input type="checkbox"/> Credit 1 <b>Site Selection</b>	1
<input type="checkbox"/> Credit 2 <b>Development Density</b>	1
<input type="checkbox"/> Credit 3 <b>Redevelopment of Contaminated Sites</b>	1
<input type="checkbox"/> Credit 4.1 <b>Alternative Transportation:</b> Public Transportation Access	1
<input type="checkbox"/> Credit 4.2 <b>Alternative Transportation:</b> Bicycle Storage & Changing Rooms	1
<input type="checkbox"/> Credit 4.3 <b>Alternative Transportation:</b> Alternative Fuel Vehicles	1
<input type="checkbox"/> Credit 4.4 <b>Alternative Transportation:</b> Parking Capacity	1
<input type="checkbox"/> Credit 5.1 <b>Reduced Site Disturbance:</b> Protect or Restore Open Space	1
<input type="checkbox"/> Credit 5.2 <b>Reduced Site Disturbance:</b> Development Footprint	1
<input type="checkbox"/> Credit 6.1 <b>Stormwater Management:</b> Rate and Quantity	1
<input type="checkbox"/> Credit 6.2 <b>Stormwater Management:</b> Treatment	1
<input type="checkbox"/> Credit 7.1 <b>Heat Island Effect:</b> Non-Roof	1
<input type="checkbox"/> Credit 7.2 <b>Heat Island Effect:</b> Roof	1
<input type="checkbox"/> Credit 8 <b>Light Pollution Reduction</b>	1
 <b><u>Water Efficiency</u></b>	 <b><u>5 Points</u></b>
<input type="checkbox"/> Credit 1.1 <b>Water Efficient Landscaping:</b> Reduce by 50%	1
<input type="checkbox"/> Credit 1.2 <b>Water Efficient Landscaping:</b> No Potable Use or No Irrigation	1
<input type="checkbox"/> Credit 2 <b>Innovative Waste Water Technologies</b>	1
<input type="checkbox"/> Credit 3.1 <b>Water Use Reduction:</b> 20% Reduction	1
<input type="checkbox"/> Credit 3.2 <b>Water Use Reduction:</b> 30% Reduction	1
 <b><u>Energy &amp; Atmosphere</u></b>	 <b><u>17 Points</u></b>
<input type="checkbox"/> Prereq 1 <b>Fundamental Building Systems Commissioning</b>	Required
<input type="checkbox"/> Prereq 2 <b>Minimum Energy Performance</b>	Required
<input type="checkbox"/> Prereq 3 <b>CFC Reduction in HVAC&amp;R Equipment</b>	Required
<input type="checkbox"/> Credit 1 <b>Optimize Energy Performance</b>	1 to 10
<input type="checkbox"/> Credit 2.1 <b>Renewable Energy:</b> 5%	1
<input type="checkbox"/> Credit 2.2 <b>Renewable Energy:</b> 10%	1
<input type="checkbox"/> Credit 2.3 <b>Renewable Energy:</b> 20%	1
<input type="checkbox"/> Credit 3 <b>Best Practice Commissioning</b>	1
<input type="checkbox"/> Credit 4 <b>Ozone Protection</b>	1
<input type="checkbox"/> Credit 5 <b>Measurement &amp; Verification</b>	1
<input type="checkbox"/> Credit 6 <b>Green Power</b>	1

**Materials & Resources**

**14 Points**

<input type="checkbox"/> Prereq 1	<b>Storage &amp; Collection of Recyclables</b>	Required
<input type="checkbox"/> Credit 1.1	<b>Building Reuse:</b> Maintain 75% of Existing Walls, Floors and Roof	1
<input type="checkbox"/> Credit 1.2	<b>Building Reuse:</b> Maintain 95% of Existing Walls, Floors and Roof	1
<input type="checkbox"/> Credit 1.3	<b>Building Reuse:</b> Maintain 50% of Interior Non-Structural Elements	1
<input type="checkbox"/> Credit 2.1	<b>Construction Waste Management:</b> Divert 50% from Landfill	1
<input type="checkbox"/> Credit 2.2	<b>Construction Waste Management:</b> Divert 75% from Landfill	1
<input type="checkbox"/> Credit 3.1	<b>Resource Reuse:</b> 5%	1
<input type="checkbox"/> Credit 3.2	<b>Resource Reuse:</b> 10%	1
<input type="checkbox"/> Credit 4.1	<b>Recycled Content:</b> 7.5% (post-consumer + ½ post-industrial)	1
<input type="checkbox"/> Credit 4.2	<b>Recycled Content:</b> 15% (post-consumer + ½ post-industrial)	1
<input type="checkbox"/> Credit 5.1	<b>Regional Materials:</b> 10% Extracted and Manufactured Regionally	1
<input type="checkbox"/> Credit 5.2	<b>Regional Materials:</b> 20% Extracted and Manufactured Regionally	1
<input type="checkbox"/> Credit 6	<b>Rapidly Renewable Materials</b>	1
<input type="checkbox"/> Credit 7	<b>Certified Wood</b>	1
<input type="checkbox"/> Credit 8	<b>Durable Building</b>	1

**Indoor Environmental Quality**

**15 Points**

<input type="checkbox"/> Prereq 1	<b>Minimum IAQ Performance</b>	Required
<input type="checkbox"/> Prereq 2	<b>Environmental Tobacco Smoke (ETS) Control</b>	Required
<input type="checkbox"/> Credit 1	<b>Carbon Dioxide (CO<sub>2</sub>) Monitoring</b>	1
<input type="checkbox"/> Credit 2	<b>Ventilation Effectiveness</b>	1
<input type="checkbox"/> Credit 3.1	<b>Construction IAQ Management Plan:</b> During Construction	1
<input type="checkbox"/> Credit 3.2	<b>Construction IAQ Management Plan:</b> Testing Before Occupancy	1
<input type="checkbox"/> Credit 4.1	<b>Low-Emitting Materials:</b> Adhesives & Sealants	1
<input type="checkbox"/> Credit 4.2	<b>Low-Emitting Materials:</b> Paints & Coating	1
<input type="checkbox"/> Credit 4.3	<b>Low-Emitting Materials:</b> Carpet	1
<input type="checkbox"/> Credit 4.4	<b>Low-Emitting Materials:</b> Composite Wood & Laminate Adhesives	1
<input type="checkbox"/> Credit 5	<b>Indoor Chemical &amp; Pollutant Source Control</b>	1
<input type="checkbox"/> Credit 6.1	<b>Controllability of Systems:</b> Perimeter Spaces	1
<input type="checkbox"/> Credit 6.2	<b>Controllability of Systems:</b> Non-Perimeter Spaces	1
<input type="checkbox"/> Credit 7.1	<b>Thermal Comfort:</b> Compliance	1
<input type="checkbox"/> Credit 7.2	<b>Thermal Comfort:</b> Monitoring	1
<input type="checkbox"/> Credit 8.1	<b>Daylight &amp; Views:</b> Daylight 75% of Spaces	1
<input type="checkbox"/> Credit 8.2	<b>Daylight &amp; Views:</b> Views 90% of Spaces	1

**Innovation & Design Process**

**5 Points**

- |                                                                                   |   |
|-----------------------------------------------------------------------------------|---|
| <input type="checkbox"/> Credit 1.1 <b>Innovation in Design</b>                   | 1 |
| <input type="checkbox"/> Credit 1.2 <b>Innovation in Design</b>                   | 1 |
| <input type="checkbox"/> Credit 1.3 <b>Innovation in Design</b>                   | 1 |
| <input type="checkbox"/> Credit 1.4 <b>Innovation in Design</b>                   | 1 |
| <input type="checkbox"/> Credit 2 <b>LEED<sup>®</sup> Accredited Professional</b> | 1 |

**PROJECT TOTAL (maximum 70 points)**

\_\_\_\_\_

**Certified:** 26-32 points **Silver:** 33-38 points **Gold:** 39-51 points **Platinum:** 52-70 points

**Appendix C – Addendum Table**

<b>Section</b>	<b>Change</b>	<b>Reason</b>	<b>Date</b>
2.	<p>Replace:  <a href="http://www.rics.org/Builtenvironment/Sustainableconstruction/Green%20value.html">http://www.rics.org/Builtenvironment/Sustainableconstruction/Green%20value.html</a></p> <p>With:  <a href="http://www.rics.org/Practiceareas/Builtenvironment/Sustainableconstruction/Green+value.htm">http://www.rics.org/Practiceareas/Builtenvironment/Sustainableconstruction/Green+value.htm</a></p>	<p>New Internet link for <i>Green Value: Green Buildings, Growing Assets</i> published by the Royal Institute for Chartered Surveyors.</p>	Dec. 19, 2007
4.4	<p>Replace:  <i>Renewable Energy Deployment Initiative (Natural Resources Canada)</i>  <a href="http://www2.nrcan.gc.ca/es/erb/erb/english/View.asp?x=692">http://www2.nrcan.gc.ca/es/erb/erb/english/View.asp?x=692</a></p> <p>With:  <i>Natural Resources Canada ecoEnergy for Renewable Heat</i>  <a href="http://www.ecoaction.gc.ca/ecoenergy-ecoenergie/heat-chauffage/index-eng.cfm">http://www.ecoaction.gc.ca/ecoenergy-ecoenergie/heat-chauffage/index-eng.cfm</a></p>	<p>Change to Natural Resources Canada program.</p>	Dec. 19, 2007
6.	<p>Replace:  <i>ASTM Standards on Building Economics, Fifth Edition</i>  <a href="http://www.astm.org/cgi-bin/SoftCart.exe/BOOKSTORE/COMPS/111.htm?L+mystore+fhex2432">http://www.astm.org/cgi-bin/SoftCart.exe/BOOKSTORE/COMPS/111.htm?L+mystore+fhex2432</a></p> <p>With:  <i>ASTM E917-05 Standard Practice for Measuring Life-Cycle Costs of Buildings and Building Systems</i>  <a href="http://www.astm.org/cgi-bin/SoftCart.exe/DATABASE.CART/REDLINE_PAGES/E917.htm?L+mystore+ebse3316">http://www.astm.org/cgi-bin/SoftCart.exe/DATABASE.CART/REDLINE_PAGES/E917.htm?L+mystore+ebse3316</a></p>	<p>Replace link to old edition of reference material with link to applicable standard.</p>	Dec. 19, 2007
6.	<p>Replace:  <a href="http://www.retscreen.net/ang/home">http://www.retscreen.net/ang/home</a></p> <p>With:  <a href="http://www.retscreen.net">http://www.retscreen.net</a></p>	<p>Provide source Internet link.</p>	Dec. 19, 2007
Appendix A	<p>Update Manitoba Green Building Policy Interdepartmental Working Group table.</p>	<p>Reflect changes to composition of the group.</p>	Jan. 14, 2008
Appendix C	<p>Add Appendix.</p>	<p>Establish table to record addendums.</p>	Dec. 19, 2007